

What is claimed is:

1. An electroplating composition comprising:
at least one soluble metal salt,
an electrolyte, and
a grain refiner/stabilizer additive comprising one or more non-aromatic compounds having π electrons that can be delocalized.
2. The composition of claim 1 wherein the metal salt comprises tin.
3. The composition of claim 1 further comprising one or more alloying metals selected from copper or silver.
4. The composition of claim 1 wherein the non-aromatic compound comprises an α,β unsaturated system or other conjugated system that contains a proximate electron-withdrawing group.
5. The composition of claim 1 wherein the non-aromatic compound comprises a cyclic system having endocyclic conjugation.
6. The composition of claim 1 wherein the non-aromatic compound comprises one or more keto-enole systems.
7. The composition of claim 6 wherein one or more of the keto-enole systems are cyclic.

8. The composition of claim 7 wherein the cyclic keto-enole systems comprise an enole functionality which is endocyclic.

9. The composition of claim 1 wherein the grain refiner/stabilizer additive has a concentration of between about 2 mg and about 10,000 mg per liter of the electroplating composition.

10. The composition of claim 1 wherein the grain refiner/stabilizer additive has a concentration of between about 50 mg and about 2000 mg per liter of the electroplating composition.

11. The composition of claim 1 further comprising a brightener agent.

12. The composition of claim 1 further comprising a suppressor agent.

13. The composition of claim 1 wherein the composition further comprises a leveler agent.

14. The composition of claim 1 wherein the electroplating composition is acidic.

15. A method for depositing a solderable finish on an electronic device substrate, the method comprising:

electrolytically depositing onto the substrate a metal from an electroplating composition that comprises at least one soluble metal salt, an electrolyte, at least one grain refiner/stabilizer additive comprising one or more non-aromatic compounds having π electrons that can be delocalized.

16. The method of claim 15 wherein the metal salt comprises tin.
17. The method of claim 15 wherein the non-aromatic compound comprises an α,β unsaturated system or other conjugated system that contains a proximate electron-withdrawing group.
18. The method of claim 15 wherein the grain refiner/stabilizer additive is present at concentration of between about 2 mg and about 10,000 mg per liter of the electroplating composition.
19. The method of claim 15 wherein the stabilizer additive is present at concentration of between about 50 mg and about 2000 mg per liter of the electroplating composition.
20. The method of claim 15 further comprising a brightener agent.
21. The method of claim 15 wherein the composition further comprises a suppressor agent.
22. The method of claim 15 wherein the composition further comprises a leveler agent.
23. The method of claim 15 wherein the substrate is a printed circuit board substrate or semiconductor with one or more microvias.

24. The method of claim 15 wherein the substrate is a microchip module substrate.

25. An article of manufacture comprising an electronic device substrate having thereon an electrolytic tin deposit obtained from an electroplating composition that comprises at least one soluble tin salt, an electrolyte, and a grain refiner/stabilizer additive comprising one or more non-aromatic compounds having π electrons that can be delocalized.

26. The article of claim 25 wherein the substrate is a printed wiring board, optoelectronic device, semiconductor package, microchip module package, component, contact, chip capacitor, chip resistor, lead frame, connector, or integrated circuits.